High-Speed Analog N-Channel DMOS FETs

SD210 / SD212 / SD214

FEATURES

- **High Input to Output Isolation 120dB**
- **Low On Resistance . . . . . 30 Ohm**
- **Low Feedthrough and Feedback Transients**
- **Low Capacitance:**
  - **Input (Gate). . . . . 2.4pF typ.**
  - **Output . . . . . 1.3pF typ.**
  - **Feedback . . . . . 0.3pF typ.**
- **No protection Diode from Gate to Substrate for Very High Impedance Applications**
- **Maximum Gate Voltage . . . . . ±40V**

APPLICATIONS

SD210:
- **Analog Switch Driver**

SD212 and SD214:
- **Analog Switches**
- **High-Speed Digital Switches**
- **Multiplexers**
- **A to D Converters**
- **D to A Converters**
- **Choppers**
- **Sample & Hold**

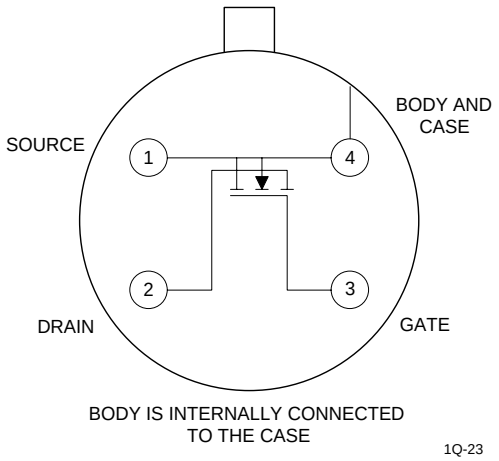
DESCRIPTION

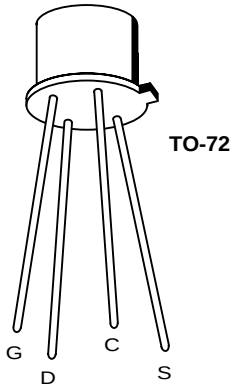
The Calogic SD210 is a 30V analog switch driver without a built-in protection diode from gate to substrate for use with SD212 and SD214 DMOS analog switches.

ORDERING INFORMATION

Part	Package	Temperature Range
SD210DE	Hermetic TO-72 Package	-55°C to +125°C
XSD210	Sorted Chips in Carriers	-55°C to +125°C
SD212DE	Hermetic TO-72 Package	-55°C to +125°C
XSD212	Sorted Chips in Carriers	-55°C to +125°C
SD214DE	Hermetic TO-72 Package	-55°C to +125°C
XSD214	Sorted Chips in Carriers	-55°C to +125°C

SCHEMATIC DIAGRAM (Top View)





CD1-2

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ABSOLUTE MAXIMUM RATINGS

Drain Current 50mA
Total Device Dissipation at 25°C Case Temperature . . . 1.2W
Storage Temperatue Range . . . . . -65°C to +200°C
Lead Temperature (1/16" from case for 10 sec.). . . . . 300°C
Operating Temperature Range . . . . . -55°C to +125°C

	PARAMETER	SD210	SD212	SD214	UNIT
V_{DS}	Drain-to-Source	+30	+10	+20	V_{dc}
V_{SD}	Source-to-Drain	+10	+10	+20	V_{dc}
V_{DB}	Drain-to-Body	+30	+15	+25	V_{dc}
V_{SB}	Source-to-Body	+15	+15	+25	V_{dc}
V_{GS}	Gate-to-Source	±40	±40	±40	V_{dc}
V_{GB}	Gate-to-Body	±40	±40	±40	V_{dc}
V_{GD}	Gate-to-Drain	±40	±40	±40	V_{dc}

DC CHARACTERISTICS (T_A = 25°C, unless otherwise specified)

SYMBOL	PARAMETER	SD210			SD212			SD214			UNITS	TEST CONDITIONS
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
BREAKDOWN VOLTAGE												
BV_{DS}	Drain-to-Source	30	35								V	V_{GS} = V_{BS} = 0V, I_D = 10µA
		10	25		10	25		20	25			V_{GS} = V_{BS} = -5V, I_S = 10nA
BV_{SD}	Source-to Drain	10			10			20				V_{GD} = V_{BD} = -5V, I_D = 10nA
BV_{DB}	Drain-to-Body	15			15			25				V_{GB} = 0V, source OPEN, I_D = 10nA
BV_{SB}	Source-to-Body	15			15			25				V_{GB} = 0V, drain OPEN, I_S = 10µA
LEAKAGE CURRENT												
I_{DS} (OFF)	Drain-to-Source		1	10		1	10				nA	V_{GS} = V_{BS} = -5V, V_{DS} = +10V
									1	10		V_{GS} = V_{BS} = -5V, V_{DS} = +20V
I_{SD} (OFF)	Source-to-Drain		1	10		1	10					V_{GS} = V_{BD} = -5V, V_{SD} = +10V
									1	10		V_{GS} = V_{BD} = -5V, V_{SD} = +20V
I_{GBS}	Gate			0.1			0.1			0.1		V_{DB} = V_{SB} = 0V, V_{GS} = ±40V
V_T	Threshold Voltage	0.5	1.0	2.0	0.1	1.0	2.0	0.1	1.0	2.0	V	V_{DS} = V_{GS} = V_T, I_S = 1µA, V_{SB} = 0V
r_{DS} (ON)	Drain-to-Source Resistance		50	70		50	70		50	70	Ω	I_D = 1.0mA, V_{SB} = 0, V_{GS} = +5V
			30	45		30	45		30	45		I_D = 1.0mA, V_{SB} = 0, V_{GS} = +10V
			23			23			23			I_D = 1.0mA, V_{SB} = 0, V_{GS} = +15V
			19			19			19			I_D = 1.0mA, V_{SB} = 0, V_{GS} = +20V
			17			17			17			I_D = 1.0mA, V_{SB} = 0, V_{GS} = +25V

AC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	SD210			SD212			SD214			UNITS	TEST CONDITIONS
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
gfs	Forward Transconductance	10	15		10	15		10	15		ms	V_{DS} = 10V, V_{SB} = 0V, I_D = 20mA, f = 1kHz
SMALL SIGNAL CAPACITANCES												
$C_{(GS+GD+GB)}$	Gate Node		2.4	3.5		2.4	3.5		2.4	3.5	pF	V_{DS} = 10V, f = 1MHz V_{GS} = V_{BS} = -15V
$C_{(GD+DB)}$	Drain Node		1.3	1.5		1.3	1.5		1.3	1.5		
$C_{(GS+SB)}$	Source Node		3.5	5.5		3.5	5.5		3.5	5.5		
C_{DG}	Reverse Transfer		0.3	0.5		0.3	0.5		0.3	0.5		

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